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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOERG HABETHA

Appeal 2009-0571
Application 10/075,310
Technology Center 2600

Decided:[1] May 5, 2009

Before KENNETH W. HAIRSTON, KARL D. EASTHOM, and ELENI MANTIS MERCADER, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] The two month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from the Final Rejection of claims 1-19 (Br. 2).[2] We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

The Disclosed Invention

Appellant's invention is directed to a network having a plurality of subnetworks which can be inter-connected by bridge terminals. Typically, different subnetworks communicate with devices in the subnetwork at a frequency f1, f2, or f3, etc. distinct to each subnetwork under a TDMA scheme. Passing signals from one subnetwork to another through the bridge terminal, which communicates with each subnetwork, requires synchronizing frames (packets) in the two subnetworks. Each subnetwork has a controller for synchronizing the frames. The frames are synchronized by shifting/delaying the frames in one subnetwork relative to the other until the frames align. The bridge terminal can also synchronize the frames. One aspect of the disclosed invention accounts for the bridge terminal switch time in determining the frame shift time. (Abstract; Figs. 1, 9; Spec. 4:25 to 5:3; 7:19 to 8:23; 9:9-15).

The Claims

Claims 1, 4, 5, 6, and 12, exemplary of the claims on appeal, follow:

> 1. A network comprising a plurality of subnetworks which can each be connected via bridge terminals and each include a controller for controlling a subnetwork, which controller is provided for shifting the frame structure of its subnetwork to at least a frame structure of another subnetwork.

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[2] The Appeal Brief (filed Feb. 15, 2007) ("Br.") and the Examiner's Answer (filed Jul. 23, 2007) ("Ans.") detail the parties' positions.

> 4. A network as claimed in claim 1, characterized in that a controller of a first subnetwork is provided for shortening frames, and at least a controller of another subnetwork is provided for lengthening frames or for inserting an unused phase between successive frames up to a prescribed frame difference of the frame structures of the two subnetworks.
>
> 5. A network as claimed in claim 1, characterized in that a controller of a subnetwork is provided for communicating with at least another controller of another subnetwork regarding the type of shift.
>
> 6. A network as claimed in claim 1, characterized in that a bridge terminal is provided for instructing the controllers of the subnetworks connecting them as to which controller is to carry out a shift and in which direction.
>
> 12. A network as claimed in claim 10, wherein the central first controller shifts the first MAC frame structure by lengthening the first MAC frames, said lengthening corresponding to a switchover time of the first bridge terminal.

Prior Art and Rejections

Malek	US 5,666,366	Sep. 9, 1997
Yonge, III	US 6,671,284 B1	Dec. 30, 2003 (filed Aug. 4, 2000)

Claims 1-19 stand rejected as obvious under 35 U.S.C. § 103 based on Yonge III ("Yonge") and Malek.

PRINCIPLES OF LAW

"[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Under § 103, a holding of

obviousness can be based on a showing that "there was an apparent reason to combine the known elements in the fashion claimed." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-41 (2007). Such a showing requires:

> "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" . . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id. at 1741 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

If the Examiner makes such a showing, the burden then shifts to Appellant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *Oetiker*, 977 F.2d at 1445.

OPINION

Claims 1-3, 7-10, and 13-19

Issues

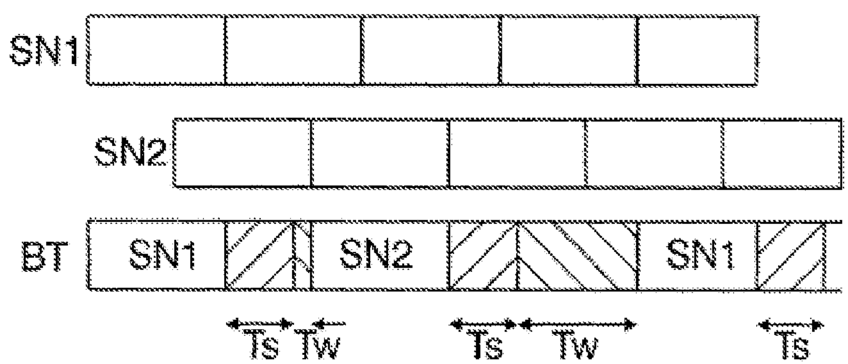
Appellant argues (Br. 5-9) that Malek and Yonge collectively do not teach shifting frames in a plurality of subnetworks connected via bridge terminals. The issues are: 1) does claim 1 require a bridge terminal, and 2) did Appellant demonstrate that the Examiner erred in finding that the references collectively teach bridge terminals connecting subnetworks, and in each subnetwork, "a controller . . . provided for shifting the frame

structure of its subnetwork to a least a frame structure of another subnetwork," as set forth in representative claim 1?[3]

Findings of Fact (FF)

Appellant's Specification

1. Appellant's Figure 5 is reproduced below:



Appellant's Figure 5 above depicts switch (Ts) and wait (Tw) time delays in a typical prior art bridge terminal BT.

As depicted above, the MAC frames in subnetworks SN1 and SN2 are not in sync. To sync the frames in the two subnetworks, the BT takes time Ts to switch – after it initiates the switch at the end of a MAC frame in either SN1 or SN2 (depending on whether switching is from SN1 to SN2 or vice versa). Then, the BT must wait time Tw until the start of the next frame in the other network SN2 or SN1 in order to sync with SN2 or SN1. (*See* Spec. 6:21-34).

[3] Appellant's arguments are directed to claim 1 (Br. 5-9). Accordingly, under 37 C.F.R. § 41.37(c)(1)(vii), claim 1 is selected to represent the group.

Yonge

2. Yonge discloses a plurality of subnetworks 622, 624, and 626 interconnected by bridge networks 628 and 630 (col. 35, ll. 6-46; Fig. 32).

3. Each bridge and subnetwork includes a MAC (medium access control) device. In general, MAC units use *inter alia*, TDMA schemes (col. 6, ll. 27-55; *see also* col. 35, ll. 33-38 (describing MAC units in the networks of Fig. 32); FF 2).

4. "In the TDMA protocol, a network master broadcasts a frame synchronization signal before each round of messages to synchronize clocks of all stations and, after synchronization occurs, each station transmits during a uniquely allocated time slice" (col. 1, ll. 20-24).

5. In one embodiment, the subnetwork searches for a synchronization signal (state A), and afterwards, if it receives one, proceeds to a frame control (state B) (col. 32, ll. 4-50). Generally, Yonge's subnetworks do not send an acknowledgment unless expected (*id.*; col. 3, ll. 26-60).

Malek

6. Malek discloses a TDMA communication system having multiple base stations 12, 15, and 16. Adjacent base stations, communicating at distinct frequencies to avoid interference, communicate with mobile telephones 10, 11, 13, and 14 at a distinct frequency (at different times for each telephone) within range of the particular base station. Thus, each base station and mobile telephone must be synchronized to avoid interference. Telephones in one base station can communicate with telephones in the same or another base station – with base stations communicating to each other via connection to conventional (POTS) analog systems connected thereto (col. 1, ll. 25-67; Fig. 1).

7. Malek's invention improves upon prior art base station synchronization techniques. The base stations of such prior art TDMA systems remain in-sync by detecting an edge of another base station's signal and then adjusting its local bit/slot pointer (col. 2, ll. 55-62). "Such a clock de-skewing technique has been known to suffer from coupling-induced EMI and other drawbacks" (*id.* at ll. 58-60).

8. Malek's improvement involves one of the base stations, a master, sending out a frame sync pulse to the other base stations, the slaves. Upon detection of the frame sync pulse from the master base station, each slave base station either inserts or deletes guard bits in its frames, or does neither, as appropriate, depending on whether or not the frames of the particular slave base station are in sync with the frames of the master base station. Such addition or deletion either lengthens or shortens the frames so that frames of each base station shift in phase/time relative to the master, and thereby, become aligned therewith.[4] Any one of the base stations may act as the master or slave. (Col. 7, l. 19 to col. 8, l. 13). The telephone handsets are synchronized to the base stations using other means (col. 8, ll. 63-65).

Analysis

Appellant does not dispute the Examiner's finding (Ans. 15) that Malek's frame shift technique (FF 8) constitutes the claimed frame shift technique. Rather, Appellant asserts (Br. 8) that Malek's technique renders Yonge's system unsatisfactory for its intended purpose by degrading it.

[4] Each frame has 240 bits per slot and 8 slots per frame. Dropping or adding bits shortens or lengthens frames, effectively causing a relative frame shift with respect to the other base stations (Malek col. 7, ll. 55-60).

However, Yonge is not required to meet the limitations of claim 1. While Appellant asserts (Br. 6) that Malek does not teach a "bridged network, as . . . conventionally used," claim 1 does not require a bridge terminal (or network). The claim only requires that subnetworks "can each be connected via bridge terminals." Malek's subnetworks can be so connected, especially since the claim does not require the bridge to perform any function.

Further, each of Malek's base stations communicates with telephones at a distinct frequency under a TDMA scheme, forming a subnetwork (FF 6), in the same manner that each of Appellant's disclosed subnetworks communicate with devices, as the Examiner found (Ans. 12) without dispute by Appellant.[5] Therefore, Malek renders obvious claim 1.

The collective teachings of Malek and Yonge also meet claim 1 even if Malek considered by itself does not render obvious claim 1, as the Examiner found (Ans. 4, 9-19). Appellant's arguments (Br. 6-8) are based on the premise that Malek's shifting technique would degrade Yonge's system because it would cause slower switching speeds across Yonge's bridge. According to Appellant (*id.*), Malek's system would require waiting until the end of a frame before switching can occur.

Appellant bases the argument on the assertion (Br. 6) that in Yonge's "conventional bridge network, acknowledgement of receipt of the message does not occur until the end of the frame, and a transfer to a subsequent subnetwork will not generally be started until the entire frame is verified as being properly received." In response, the Examiner reasonably found (Ans.

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[5] *See also* "The Disclosed Invention" (describing Appellant's system), *supra*, hereby designated as factual findings.

17, *see* FF 4, 5) that any such acknowledgement (ACK or NACK in the ARQ Protocol) is "a process that occurs after synchronization" because bridges or new stations first synchronize, and then transmit based on their allotted slot time. Appellant does not rebut this finding.

Moreover, Appellant's Specification (Fig. 5) and arguments (Br. 6)[6] make clear that conventional prior art systems, such as Yonge's, instigate a switch (having switch time Ts) at the end of a frame in subnetwork 1 (SN1), and then wait a time (Tw) until the *start* of the next frame in subnetwork 2 (SN2) – thus synchronizing the bridge to SN2 so that the data frames from SN1 can be transferred to SN2 (FF 1).[7]

With Malek's teaching of keeping the SN1 and SN2 (two base stations) frames in sync (FF 8), it is evident from Appellant's Figure 5 (*see* FF 1) that applying Malek's teaching to Yonge's system would result in a Tw wait time that is *always less* than a frame width time. That is, if Tf is here designated as a frame width time, then the modified system would result in wait time Tw = Tf – Ts. Such a wait time, in some instances, is shorter than the prior art system Tw times (i.e., shorter when the prior art time Tw + Ts is greater than a frame width Tf as occurs at the right-hand side of Appellant's Figure 5 (*see id.*)).

In other words, in the prior art systems, such as Yonge's, Tw varies (it can be greater than, less than, or equal to a frame width time Tf) as a

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[6] Appellant states that Yonge's system is a conventional bridged network having "significant non-zero [switch] delay"; i.e., like the prior art BT having Ts delay in Appellant's Figure 5 (*see* FF 1).
[7] The system is analogous to slowing or speeding one train adjacent to another so that two car doors (frames) line up such that cargo (data) can be transferred from one train to the other.

function of the relative shifts of the two frame sequences in subnetworks SN1and SN2 with respect to each other when the bridge terminal BT switches at the end of a frame in either SN1 or SN2. On the other hand, Malek's modification would result in fixing Tw as a function only of Ts and Tf, and, as noted *supra*, Tw would always be less than Tf, because the two frame sequences in SN1 and SN2, being in sync, never vary with respect to one another. (*See* FF 1).

Therefore, employing Malek's TDMA sync system would have been an obvious improvement to Yonge's TDMA sync system in terms of decreased interference as the Examiner generally found (Ans. 11), and also, in terms of a highly predicable fixed (as a function of Tw and Tf) and decreased (less than Tf) sync time (*see* FF 1 and discussion *supra*).

Appellant's related argument (Br. 6, 7) that the two TDMA sync systems are unrelated and thus not combinable, allegedly because Yonge employs a bridge while Malek does not, must fail, since the ultimate goal of each TDMA system is to facilitate passing information from one subnetwork to another. The problem involved in each system is that subnetworks are out of sync based on operation at different frequencies. Yonge's system requires synced subnetworks to pass information across a bridge, while Malek's system requires synced subnetworks because mobile telephones travel across the different subnetworks. Malek simply teaches a solution to the TDMA sync problem as the Examiner found (Ans. 12-14). (*See* FF 1-8). The Examiner also found (Ans. 13, 14), without rebuttal, that Malek teaches the sync system as applicable to a specific (LAN) bridged network system.

Conclusion

Claim 1 does not require a bridge terminal. Alternatively, the references collectively teach bridge terminals connecting subnetworks, and in each subnetwork, "a controller . . . provided for shifting the frame structure of its subnetwork to a least a frame structure of another subnetwork," as set forth in claim 1.

Claim 4

Issue

Did Appellant demonstrate that the Examiner erred in finding Malek's controller of a first subnetwork is provided for shortening frames, and at least a controller of another subnetwork is provided for lengthening frames, as required by claim 4?

Analysis

Appellant's argument (Br. 9) that "[t]he combination of Yonge and Malek does not teach defining a prescribed frame difference and correspondingly shortening frames in one subnetwork while lengthening the frames in another up to this prescribed difference" is not commensurate in scope with claim 4. That is, the claim does not recite "defining a prescribed frame difference," nor any correspondence between subframes, and therefore, does not preclude Malek's independent synchronization, contrary to Appellant's arguments (*see id.*). Further, since the limitations prior to the conjunctive "or" are met, those that follow are superfluous to the rejection, contrary to Appellant's implied argument (*id.*).

As the Examiner found (Ans. 7, 12), each of Malek's slave base stations act as controllers for shortening and lengthening frames. Appellant

does not dispute this finding. In other words, Malek's slave base stations (controllers) and telephones constitute different subnetworks, and each controller thereof can either shorten or lengthen a frame time (based on a sync signal from the master) (FF 6, 8). Therefore, for the reasons explained above, Malek, considered by itself, renders obvious claim 4; alternatively, the combination of Yonge and Malek suggests the limitations thereof.

Conclusion

Appellant did not demonstrate that the Examiner erred in finding that Malek's controller of a first subnetwork is provided for shortening frames, and at least a controller of another subnetwork is provided for lengthening frames, as required by claim 4.

Claim 5

Issue

Did Appellant demonstrate that the Examiner erred in finding that Malek's "controller of a subnetwork is provided for communicating with at least another controller of another subnetwork regarding the type of shift" as set forth in claim 5?

Analysis

In response to Appellant's argument (Br. 9, 10) that Malek's master pulse does not convey any information regarding the type of shift, the Examiner reasoned (Ans. 22) that based on the pulse signal from the master, the slave determines the type and direction of shift required. In other words, the master constitutes a subnetwork, which communicates, via the sync pulse, with the other subnetwork, the slave, regarding the type of shift (FF 8), as required by claim 5. The sync pulse from the master subnetwork

dictates (communicates) which way each subnetwork slave will shift. (*See also* the related discussion, *infra*, with respect to claim 6, incorporated here by reference).

Conclusion

Appellant did not demonstrate that the Examiner erred in finding that Malek's "controller of a subnetwork is provided for communicating with at least another controller of another subnetwork regarding the type of shift" as set forth in claim 5.

Claim 6

Issue

Did Appellant demonstrate that the Examiner erred in finding that Malek singularly, or, Malek and Yonge collectively, teaches or suggests "a bridge terminal . . . provided for instructing the controllers of the subnetworks connecting them as to which controller is to carry out a shift and in which direction," as set forth in claim 6?

Finding of Fact

9. Appellant's disclosure states that the subnetwork controllers can "reach an agreement via the bridge terminal as to the direction in which the frames are to be shifted respectively" (Spec. 9:13-15).

Analysis

In response to Appellant's argument (Br. 10) that Yonge and Malek do not teach or suggest "communications between a bridge terminal and the controllers of the subnetworks . . . specifically . . . regarding which the [sic] direction to which each subnetwork is to shift," the Examiner employs similar reasoning to that above for claim 5, and further asserts (Ans. 23) that

Malek's "master base station is assuming the role of the bridge terminal and the slave base stations taking the role of the subnetwork controllers."

Hence the issue turns partly on whether or not Malek's master base station reasonably constitutes a bridge terminal, or, if in combination with Yonge, Malek's master base station teachings can be applied to Yonge's bridge terminal. With respect to the first question, as indicated *supra*, Appellant asserts (with respect to claim 1 from which claim 6 depends), that Malek's master base station does not reasonably constitute a bridge terminal.[8]

On the record before us, a bridge terminal reasonably appears to be an interconnection between two subnetworks (*see* FF 2; n.5 *supra*) that facilitates communication between the two. In Malek's system, a mobile telephone traveling across different subnetworks can communicate with another telephone in another subnetwork only by virtue of the master base station synchronizing the slave base station subnetworks (FF 8).[9] Thus, Malek's base station reasonably constitutes a bridge terminal between two subnetworks, and also suggests a similar master clock generator system as a

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[8] Under our analysis above, claim 1 does not require a bridge terminal nor recite any specific function of that terminal. Claim 6, on the other hand, does.

[9] Appellant's argument (Br. 6 (citing Malek, col. 1, ll. 41-54)) that base stations do not transfer messages to each other "per se" because they are connected to the public telephone system (POTS) does not refute the finding that the master facilitates communicate by synchronization, nor the finding that mobile telephones in the two different base station subnetworks communicate with each other via the base stations and the public lines (*see* FF 8; Br. 6; and discussion *supra*). "The problem in this case is that the appellants failed to make their intended meaning explicitly clear." *In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997). "It is the applicants' burden to precisely define the invention, not the PTO's." *Id.*

modification of Yonge's bridge terminal, generally as the Examiner reasoned (*see* Ans. 12, 23).

With respect to the "instructing" limitation, for reasons similar to those for claim 5, the bridge/master base station transmits frame sync pulses to each slave base station which either inserts (lengthens) or deletes (shortens) guard bits in its respective frame sequence, or does neither, as appropriate, depending on whether or not the frames of the particular slave base station are in sync with the frames of the master base station (FF 8). Appellant similarly discloses an instruction regarding shift direction reached by "agreement" between the bridge and subnetworks (FF 9). Therefore, Malek's frame sync pulse reasonably constitutes an instruction to the controllers of each slave subnetwork which each accordingly carry out a shift in the appropriate direction as necessary to sync with the pulse (FF 8).

For the reasons explained above, Malek renders obvious claims 5 and 6; alternatively, the combination of Yonge and Malek suggests the limitations thereof.

Conclusion

Appellant did not demonstrate that the Examiner erred in finding that Malek singularly, or Malek with Yonge collectively, teaches a bridge terminal provided for instructing the controllers of the subnetworks connecting them as to which controller is to carry out a shift and in which direction, as set forth in claim 6.

Claims 11 and 12

Issue

The issue with respect to claims 11 and 12, is: Did Appellant demonstrate that the Examiner erred in finding that Malek singularly, or Malek and Yonge collectively, teaches or suggests a "central first controller shift[ing] the first MAC frame structure by lengthening the first MAC frames, said lengthening *corresponding to a switchover time* of the first bridge terminal" as set forth in claim 12 (emphasis added)?[10]

Analysis

In response to Appellant's argument (Br. 10) that the references do not teach or suggest any correspondence between the shift and the switchover time of the bridge terminal, the Examiner concludes that such a correspondence would have been obvious. The Examiner acknowledges (Ans. 24) that "Yonge is silent on switchover time," but reasons that "any bridge . . . incur[s] a switchover time . . . . [and a]pplying Malek's principle of lengthening a frame . . . , it is obvious to increase [the] subnetwork2 frame to compensate for the switchover time resulting from the bridge switching from subnetwork1 to subnetwork2."

The Examiner's response falls short of persuasive "'articulated reasoning with some rational underpinning,'" *see KSR*, 127 S. Ct. at 1741 (quoting *Kahn*, 441 F.3d at 988), because the "underpinning" lacks a persuasive link between Yonge's unmentioned, but inherent, switch time, and Malek's sync scheme – i.e., a "corresponding" link as required by claims 11 and 12. Underlying our analysis *supra* is the finding that Malek's

[10] Claims 11 and 12 recite similar limitations and Appellant argues the claims together (Br. 10). Thus, claim 11 stands or falls with claim 12.

sync scheme benefits Yonge's TDMA sync system without any regard to switch time. As such, it is not clear how any switch time/frame shift correspondence or compensation could occur according to our findings or the findings made by the Examiner. On the basis of the evidence as a whole and the relative persuasiveness of the arguments, *see Oetiker*, 977 F.2d at 1445, Appellant has demonstrated that the Examiner erred with respect to claims 11 and 12.

Conclusion

Appellant demonstrated, with respect to claims 11 and 12, that the Examiner erred in finding that Malek singularly, or Malek and Yonge collectively, teaches or suggests a central first controller shifting the first MAC frame structure by lengthening the first MAC frames, said lengthening corresponding to a switchover time of the first bridge terminal.

DECISION

We affirm the Examiner's decision rejecting claims 1-10 and 13-19. We reverse the Examiner's decision rejecting claims 11 and 12.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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